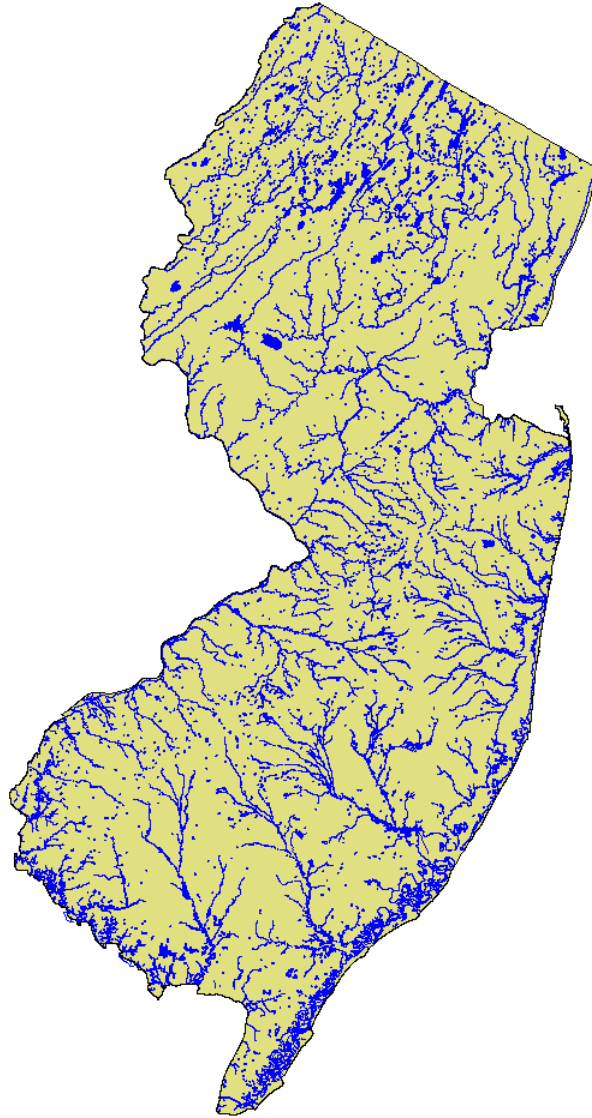


DRAFT

New Jersey Department of Environmental Protection  
Bradley M. Campbell, Commissioner

**Water Supply Action Plan 2003-04**

New Jersey Statewide Water Supply Planning Process



## **Water Supply Action Plan 2003-04**

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| <b>Action 1</b>  | <b>Improve the Emergency Water Supply Interconnection Between the Raritan and Passaic Water Supply Systems</b> |
| <b>Action 2</b>  | <b>Construct Confluence Pumping Station in the Raritan River Basin</b>   |
| <b>Action 3</b>  | <b>Initiate Northeast NJ Water Supply Alternatives Study</b>   |
| <b>Action 4</b>  | <b>Initiate Toms River/Metedeconk River Water Supply Study</b>   |
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| <b>Action 6</b>  | <b>Re-evaluate Critical Water Supply Areas Nos. 1 and 2</b>  |
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| <b>Action 8</b>  | <b>Issue Report on Atlantic County Water Supply (Executive Order 32)</b>                                       |
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**New Jersey Department of Environmental Protection  
Water Supply Action Plan 2003-04  
New Jersey Statewide Water Supply Planning Process**

***The Need for Action***

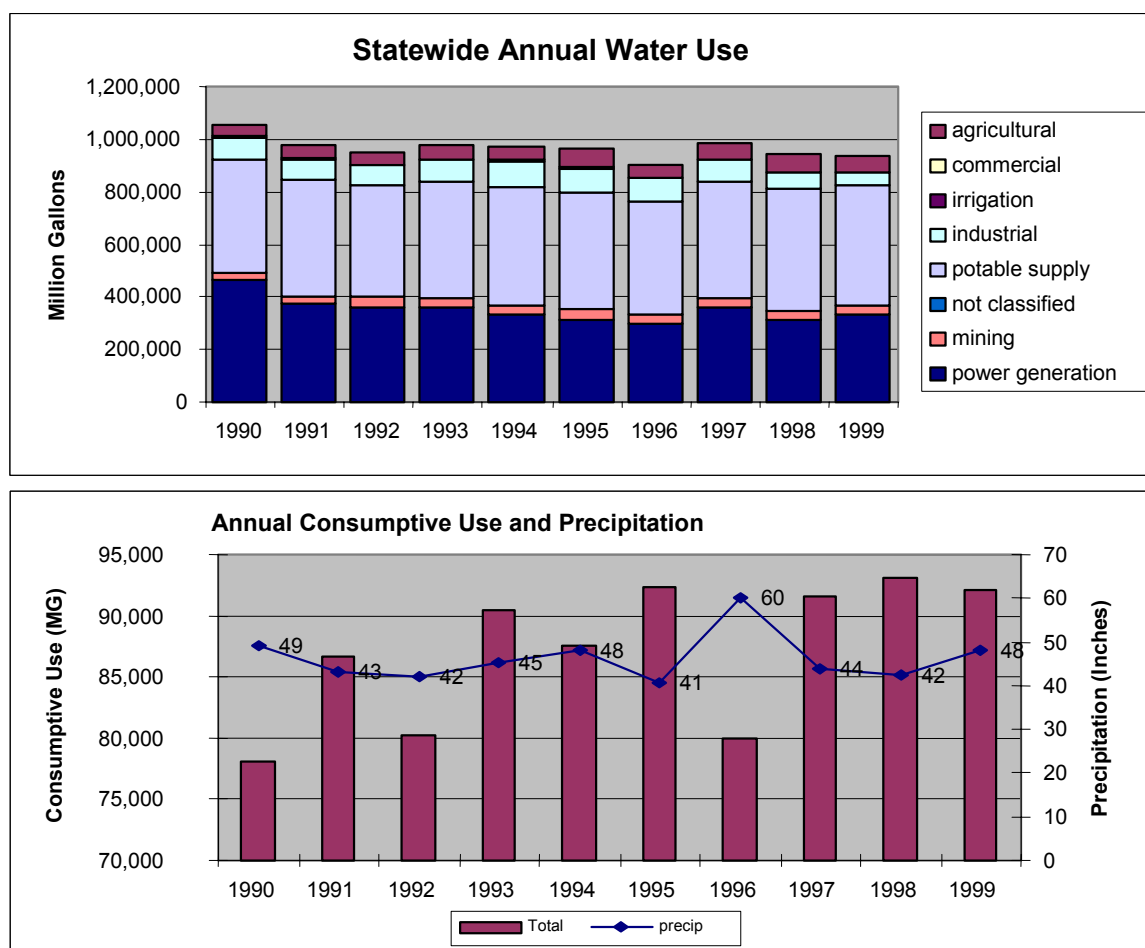
Despite a statewide average precipitation of 45 inches per year, New Jersey must plan its use of water carefully to prevent regional shortages and avoid ecological impacts associated with water overuse. The availability of fresh water is a limiting factor in the potential development and redevelopment of the State. Recurrent drought has amplified the vulnerability of the State's water resources. Responsible planning that defines the availability of water for its many uses and sets allowable limits for the impacts associated with water use will facilitate both the Governor's Smart Growth Initiative and the protection of natural resources. The Water Supply Action Plan 2003-04 (Action Plan) defines initiatives for immediate implementation to address critical water resource issues.

New Jersey has a formal water supply planning process. The New Jersey Statewide Water Supply Plan (NJSWSP) provides a framework to guide the management of potable, industrial, recreational and ecological uses, initiate water conservation strategies, and develop the State's water supply resources to ensure that a safe and adequate water supply will be available into the foreseeable future, including during times of drought. The NJSWSP and its periodic revision are mandated by the 1981 Water Supply Management Act (N.J.S.A. 58:1A-1 et seq.). In 1982, NJDEP adopted the first New Jersey Statewide Water Supply Master Plan and the first major revision was completed in 1996. As a result of these plans, numerous water resource investigations have been completed, multiple infrastructure improvement projects identified and constructed, and policy and regulatory changes implemented. Periodic revisions of the plan are necessary to ensure that the latest scientific knowledge, water demand patterns, and environmental policies guide water use. The next update of the New Jersey Statewide Water Supply Plan is due to be completed by January 2007. However, the lessons learned during recent droughts stress the need for certain actions, which cannot be delayed until that update is completed. The Action Plan identifies those actions as an interim step in the ongoing statewide water supply planning process.

***The State's Water Use Profile***

The population of New Jersey grew by 680,000 between 1990 and 2000 and is expected to grow by another 650,000 over the next decade. This growth in statewide population, coupled with a concentration of growth in areas that have not previously experienced high water demand, have placed an additional strain on the state's water resources and water supply infrastructure. During the 1990's, annual statewide water use declined by 8% or 80 billion gallons, primarily due to a reduction in industrial use and power generation. Over the same time period, annual statewide use of water for public supply, mining, and agriculture have increased. Uses that remove water from its natural drainage area (i.e. its watershed) in the form of water vapor (i.e. evapotranspiration) are known as "consumptive uses." Throughout the 1990's, consumptive uses increased by 14% or 11 billion gallons. Irrigation for domestic, commercial and agricultural purposes are consumptive uses that have all increased over the past decade. The following tables illustrate water use trends during this period.

## Plate 1: Statewide Water Use

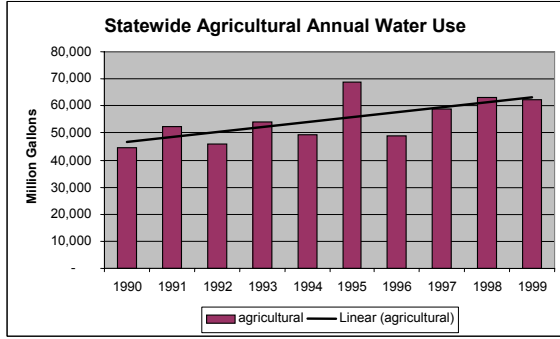


## Change in Total and Consumptive Water Use within WMAs 1990 to 1999

Watershed Management Area	90-99 Change in Total Use		90-99 Change in Consumptive Use	
	Volume (mg)	Percent of 1990	Volume (mg)	Percent of 1990
Barnegat Bay	3,397	16%	893	33%
Cape May County	753	16%	207	22%
Central Delaware	-18,809	-24%	-1,203	-15%
Crosswicks	56,824	30%	2,552	35%
Elizabeth, Rahway, and Woodbridge	-4,129	-34%	-85	-8%
Great Egg Harbor and Tuckahoe	3,127	16%	220	5%
Hackensack and Pascack	-4,703	-14%	-345	-10%
Lower Delaware	-14,052	-22%	152	2%
Lower Passaic and Saddle	-115,160	-62%	1,346	27%
Lower Raritan, South, and Lawrence	13,017	24%	1,917	32%
Maurice, Salem, and Cohansey	4,706	10%	2,241	24%
Millstone	1,085	18%	76	6%
Monmouth County	1,145	5%	600	20%
Mullica and Wading	10,309	33%	-482	-8%
North and South Branch Raritan	1,298	19%	265	30%
Pompton, Pequannock, Wanaque, and Ramapo	-1,562	-2%	240	3%
Rancocas	1,392	9%	692	41%
Upper Delaware	-14,454	-14%	750	39%
Upper Passaic, Whippany, and Rockaway	-758	-2%	536	12%

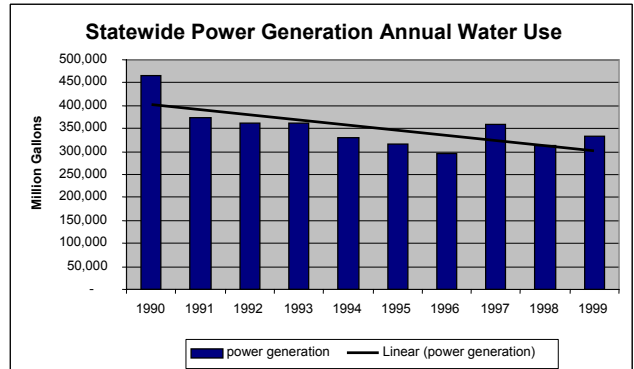
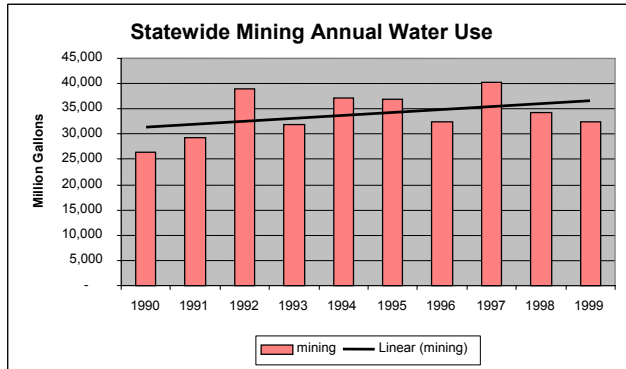
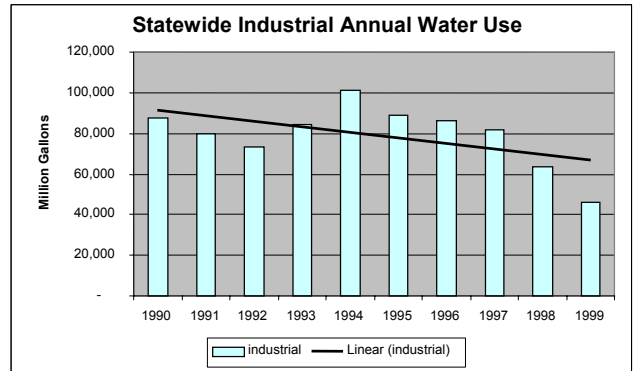
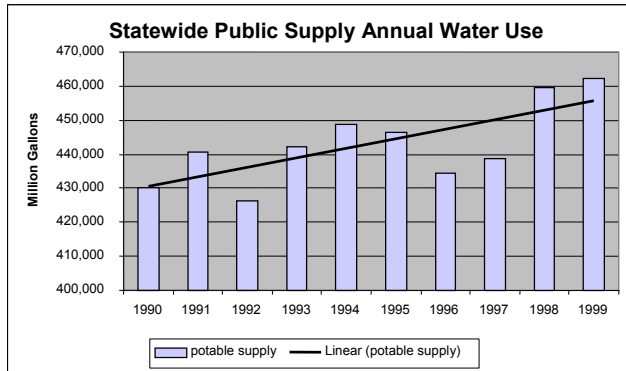
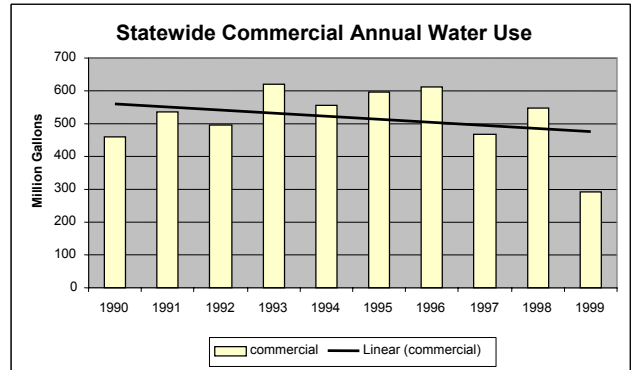
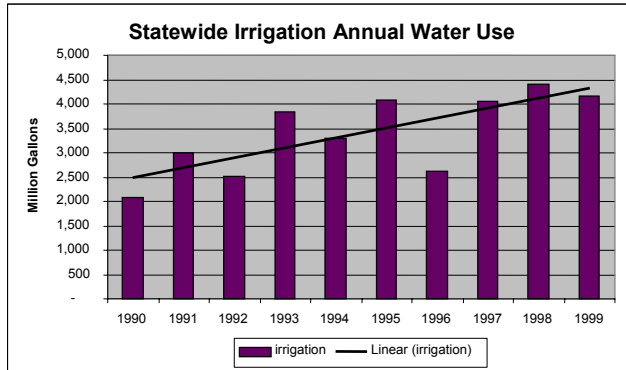
Walkill, Pochuck, and Papakating	419	14%	51	13%
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## Plate 2: Water Use by Use Group



**1990 to 1999 Change in Statewide Water Withdrawals by Use Group**

Use Group	% of 1990 Total Use	% of 1999 Total Use	Change 1990-1999 (MG)	% Change within Use Group
commercial	0.1%	0.1%	-68	-15%
irrigation	0.2%	0.5%	1,500	74%
potable	41%	48%	25,000	6%
Grand Total	--	--	-80,000	-8%



Water use trends vary significantly across the state. For example, in the Crosswicks Creek Watershed, consumptive use has increased by 35% or 2,500 million gallons (MG) and total use has increased by 30% or 57,000 MG over the past decade, due primarily to increases in consumption for power generation. In the Lower Passaic and Saddle River Watersheds, total water use has declined by 62% or 13 billion gallons, while consumptive use has gone up by 27% or 1,300 MG. The trends in the Passaic and Saddle River watersheds are due to lower power and industrial uses and increased residential and irrigation consumptive use.

In many parts of the state, large public water systems transfer water between watersheds to reach users. Many of these users are in turn serviced by regional sewage treatment plants that may send treated wastewater to another watershed or to oceans, bays and estuaries where the potential for recharge is completely lost. The transfer of fresh water and wastewater between watersheds or to the outlets of watersheds disrupts their natural water budgets, altering stream flow and often changing water quality. Statewide, sewage treatment plants discharge approximately 1 billion gallons of treated freshwater daily, with 750 million gallons going directly to salt-water bodies. These salt-water discharges bypass large freshwater ecosystems and make the treated wastewater unavailable for recharge, recycling through the natural system or innovative uses to “re-use” the treated effluent.

### ***The Drought Factor***

Climatic variations that cause droughts are normal and can be expected to occur periodically. Over the last 10 years, however, New Jersey governors have been forced to declare statewide or regional drought emergencies in 1995, 1999 and 2002. Record low stream flows and groundwater levels during New Jersey’s recent experiences with drought increasingly emphasized the need to refine its approach to managing regional water supply and demand. To this end, the State now implements a range of water supply management options based upon regional variations in drought conditions. The integration of a suite of water supply and climate-driven indicators across six (6) distinctive drought regions better allows water supply managers to assess and address varying conditions. The disruptive nature of drought events needs to be recognized in water supply planning and regulation. Restrictions on water use during droughts have a direct impact on the state’s economy but are necessary to protect potable supplies and aquatic resources.

Sufficient water supply reserves to sustain users during times of drought are needed. Improvements need to be made in the State’s water supply infrastructure to facilitate movement of available supplies during drought events from areas of surplus to areas of need. At the same time, increased emphasis needs to be placed on public education, water conservation and beneficial reuse efforts to mitigate the adverse effects of droughts that are exacerbated by excessive outdoor water use.

### ***The Action Plan***

The State will undertake several immediate actions that include water supply construction projects, water supply studies in addition to acquisition, legislative and NJDEP initiatives. These action items are to address increasing demand, recurrent drought, aging water-supply infrastructure, and changes in water-use trends. Several of these initiatives will make more water available in existing population centers and projected growth areas. The measures outlined in the Action Plan are relatively short-term responses to comprehensive water resource issues that were previously identified through the Statewide Water Supply Planning process. The need for additional measures in these areas will continued to be evaluated and may be

addressed in forthcoming Statewide Water Supply Plan efforts. The Action Plan also provides an interim response to changes in water use patterns as well as an increased recognition of the need to protect all designated uses of water, including those that benefit wildlife and associated habitat. The Action Plan reflects recommendations contained in the 1996 New Jersey Statewide Water Supply Plan (NJSWSP) and lessons learned during recent drought events.

Because of differences in water sources and the response of hydrologic systems to water use, some actions are limited to specific areas of the state to address water supply concerns that differ from region to region, while others actions will be applied statewide to address more universal concerns throughout New Jersey.

### ***Regional Action Items:***

#### **Issue: Susceptibility of Northeastern New Jersey to Recurrent Drought**

Northeastern New Jersey supports a significant portion of the state's populace, with approximately 40% of the state population residing in the five northeastern counties of Bergen, Essex, Hudson, Passaic and Union. The region's water demand is largely reliant on surface water supplies for potable water, making this area more susceptible to drought than elsewhere in the state. Actions to mitigate the effects of drought have been taken about every three to five years in this region over the past two decades. As increased development and water supply demand increase, the impact of severe drought on the reliability of the existing water supply systems in the Northeast will continue to be a concern. The 1996 NJSWSP placed a priority on the evaluation of alternative water supplies for this region as well as improving the interconnection between the major water supply systems of the Passaic and Raritan River Basins. These initiatives have not yet been addressed.

In 1981, the Elizabethtown/Newark emergency interconnection (Virginia Street interconnection) was constructed in Newark, with the design capacity of the interconnection being identified as 30–35 MGD. This design capacity was based on infrastructure improvements to the Elizabethtown Water Company and City of Newark's water distribution systems along with the construction of the Virginia Street Pump Station. As part of the feasibility study that was responsible for the Virginia Street interconnection, it was also envisioned that the interconnection's capacity could ultimately be increased to 60 MGD; however, this increased capacity would require significant infrastructure improvements.

There are two major factors limiting the interconnection from maximizing its present design capacity of 30–35 MGD. First is the need for greater transmission capacity within the Elizabethtown system. Second is the need for a booster pumping station at Belleville to transfer water delivered by Elizabethtown, in excess of Newark's demands, into the Wanaque Aqueduct so it can be used by other water systems in the Passaic River Basin.

#### **Action Item 1 – Improve the Emergency Water Supply Interconnection Between the Raritan and Passaic Water Supply Systems**

As discussed immediately above, proposed infrastructure improvements are necessary to improve the emergency and non-emergency water supply interconnection capability between the Raritan and Passaic Basin water supply systems. A range of water supply transfers between the two basins can be realized through varying levels of either management strategies and/or enhancements to existing infrastructure.



**Outcome:**

- **Enhanced E'town to Newark Water Transfer** – A daily, non-emergency transfer of approximately 10 MGD between the two systems is entirely possible with the use of existing infrastructure. This transfer can be realized through agreements among area water suppliers (North Jersey District Water Supply Commission, City of Newark Water Department and Elizabethtown Water Company), and would effectively increase the safe yield in the Passaic River Basin.
  - **COST:** No capital infrastructure costs. The water transfer pricing will be determined via negotiations between water suppliers, with BPU oversight.
  - Raises potential water allocation permit issues with Elizabethtown Water Company since nearly all of the safe yield (surface water) within the Raritan Basin has been allocated.
- **Belleville Pump Station** - The proposed construction of a booster pump station at Newark's Belleville Reservoir Complex along with improvements in Elizabethtown's transmission system are needed in order to increase the daily transfer of water from the Raritan Basin to the Passaic Basin. The pump station can be designed with either a 15 or 30 MGD capacity, with the associated cost differentials outlined below. Implementation of this project, including design, permitting, bid phase/contract award and construction can be completed within 20 months once funding is secured.
  - **COST:** \$1.95 to \$3.25 Million
  - Selected pump station capacity (i.e. 15 or 30 MGD) is dependent upon overall intended Raritan to Passaic River Basin transfer design.
- **Virginia Street Pump Station** – The Virginia Street Pump Station should be retrofitted to include two-way pumping thus allowing high rates of transfer into the Raritan Basin during a water supply emergency in the Raritan Basin.

## Action Item 2 – Construct Confluence Pumping Station in the Raritan River Basin

The 1982 New Jersey Statewide Water Supply Master Plan recommended that the Eastern Raritan Basin be evaluated via a water supply feasibility study. This study was completed in 1992. Based upon the study, an Implementation Plan for the Eastern Raritan Basin Water Supply Feasibility Study was initiated and finalized in 1994. The Implementation Plan concluded that when the Raritan River Basin's surface water demand reached a certain threshold, time schedules for capital project implementation should begin. There were two capital projects identified: Kingston Quarry Reservoir and the Confluence Pumping Station. The Kingston Quarry was chosen as the most cost-effective project with an estimated capital cost of \$57 million with a safe yield of 65 MGD and the Confluence Pumping Station was the second viable option with an estimated capital cost of \$71 million and a safe yield of 53 MGD. Based upon Trap Rock Industries, Inc. variable rate of mining, the lack of any formal agreement with the State and that the safe yield of the Raritan River Basin is almost entirely allocated, the Department is moving forward with the Confluence Pumping Station project. NJDEP formally authorizes the NJWSA to be the responsible agency for the design, construction and securing of all necessary funds to move forward with the construction of the Confluence Pumping Station at the confluence of the North and South Branches of the Raritan River. In addition, the NJWSA shall initiate discussions with Trap Rock Industries, Inc. in order to secure an agreement of the Kingston Quarry for eventual use as a reservoir in the Raritan River Basin.

**Outcome:** The Confluence Pumping Station will deliver water for storage in the Round Valley Reservoir and supplement the safe yield of the Raritan River Basin, which is almost entirely allocated. The Confluence Pumping Station will support future demand in the Raritan Basin and the ability to provide additional water to the Passaic Basin via the Virginia Street interconnection during times of emergency and, possibly, non-emergency. Based upon earlier modeling conducted as part of the feasibility study, the safe yield of the Raritan System could increase by as much as 53 MGD upon completion of this project. Design engineers have suggested that the safe yield be re-evaluated to assess changes in land use patterns and water use over the past ten years. Moreover, the effect of water storage from the Confluence project must be taken into account given Round Valley Reservoir's recent designation as a "Category 1" water body.

**COST:** The estimated capital cost in 1994 was \$71 million dollars. Under the New Jersey Water Supply Authority Act (N.J.S.A. 58:1B-1 et seq.), the NJWSA has the authority to issue bonds for projects that conform to the recommendations of the New Jersey Statewide Water Supply Plan, which this project does, having already been identified. This expenditure can be recovered from the customers benefited by the project (as per Water Supply Bond Act P.L. 1983, Chapter 355, approved September 29, 1983).

### **Action Item 3 – Initiate Northeast NJ Water Supply Alternatives Study**

NJDEP will conduct a water supply feasibility study of northeastern New Jersey, focused primarily on the Passaic and Hackensack River Basins. This study will evaluate the capability of the region's surface and groundwater supply sources to provide adequate water during droughts of varying severity and will contain recommendations to improve the capability of the region to endure a sustained, severe drought.

Alternatives that will be evaluated include improved management of and coordination between major water supply systems/purveyors, improved efficiencies among water systems (storage, treatment and delivery) and infrastructure, increased education and conservation to reduce demand/consumptive use, increased fees to reduce consumptive use, expansion of existing reservoirs, construction of new reservoirs, improved system connections, improved connections between reservoirs, conservation, reclamation, conjunctive use of ground water and surface water, interstate use of the Hudson River, and increasing supply through improvements in water quality.

**Outcome:** The evaluation will recommend specific actions to lower the region's vulnerability to drought and associated costs.

**COST:** Estimated cost of the feasibility study is \$800,000, with funding provided through an appropriation from the Water Supply Fund, as enacted under P.L. 1991, C. 346, Passaic-Hackensack Water Supply Basin Study.

### **Issue: Declining Water Levels in Confined Aquifers Outside Designated Water Supply Critical Areas in the Coastal Plain of Southern New Jersey**

Ground water levels in several of the confined aquifers in the New Jersey Coastal Plain are not regulated by the rules governing the establishment and management of water allocations within Areas of Critical Water Supply, pursuant to P.L. 1993, c. 202 of the Water Supply Management Act (N.J.S.A. 58:1A-1 et seq.). While the threat of saltwater intrusion exists in only a few places, declining ground water levels are indicators of potential future problems with

maintaining use at sustainable levels. Increased growth in southern New Jersey combined with Critical Water Supply Area prohibitions will continue to place excessive demands on unconfined aquifers.

The 1996 NJSWSP identified the Toms and Metedeconk River Watersheds as areas where water supply demands exceed sustainable levels. To meet the increasing demands, purveyors often turned to the unconfined aquifers in the eastern half of the region since confined aquifer withdrawals are limited by the Critical Water Supply Area No. 1 regulations and unconfined aquifer withdrawals are discouraged in the Pinelands. Comprehensive ground water investigations have subsequently confirmed that consumptive withdrawals from the unconfined aquifers are resulting in reduced stream flows in this region. In addition, localized saltwater intrusion has been identified in the Point Pleasant area. Population is projected to substantially increase in the region over the next several decades, which in turn will place even more stress on its water resources.

#### **Action Item 4 – Initiate Toms River/Metedeconk River Water Supply Study**

NJDEP will contract with USGS and an outside consultant to conduct a comprehensive water supply capital initiative in the Northern Coastal Region to identify viable water supply options that do not impact the existing Critical Water Supply Area No. 1 or the Pinelands, reduce stream flows, or cause saltwater intrusion.

**Outcome:** The study will consider use of the Manasquan Reservoir to supplement water supplies to the Northern Coastal Region. As identified in the 1996 NJSWSP, the Toms and Metedeconk River Watersheds are currently in deficit and the adjacent Manasquan River Watershed possesses a surplus due to the construction of the Manasquan Reservoir. While the Manasquan Reservoir is not expected to resolve the entire water supply problem in the deficit watersheds, it can play a meaningful role in reducing the current stress. Other alternatives to be evaluated include seasonal conjunctive use of confined and unconfined aquifers, aquifer storage (recharge) and recovery, water conservation, and water reuse. Existing ground water models will be employed to determine the most optimum alternatives for the region. An institutional analysis will be conducted to determine how the water supplies of the region should be managed.

**COST:** Estimated cost of the feasibility study is \$200,000, with funding provided through an appropriation from the Water Supply Fund, as enacted under P.L. 1991, C. 347, Ocean County Feasibility Study.

#### **Action Item 5 – Initiate Maurice River Water Supply Study**

NJDEP will contract with USGS and an outside consultant to conduct a comprehensive water supply capital initiative in this region to redistribute potable supplies from portions of the region that possess surplus supplies due to their smaller populations to other portions that are in deficit.

**Outcome:** The project will consider the New Jersey American Water Company (Tri-County) pipeline from the Delaware River that now extends into northern Gloucester County as an alternative source of water. Other alternatives that will be evaluated include seasonal conjunctive use of confined and unconfined aquifers, aquifer storage (recharge) and recovery, strategically locating new wells in the unconfined aquifer, and sizable water conservation and

reuse initiatives. Existing ground water models will be employed to determine the most optimum alternatives for the region. An institutional analysis will be conducted to determine how the water supplies of the region should be managed.

The study will also identify viable supply options to meet the growing demand in the Maurice River Watershed. (The 1996 NJWSMP identified the Maurice River Watershed as an area where water supply demands are exceeding the sustainable level.) Nearly 80 percent of water use in this watershed is consumptive, in the form of exported public supply water and consumptive withdrawals for agriculture. The source of water in this area of southwestern New Jersey is largely limited to the unconfined aquifer system. Comprehensive ground water studies have confirmed that consumptive withdrawals from the unconfined aquifers have resulted in significant reductions in stream flow. The population in the watersheds located immediately to the north is growing rapidly. If present trends continue, it may be necessary to declare this deficit watershed as an Area of Critical Water Supply Concern.

**COST:** Estimated cost for this project is \$200,000, with funding provided through an appropriation from the Water Supply Fund, as enacted under P.L. 1991, C. 348, Growth Areas Feasibility Study.

### **Action Item 6 – Re-evaluate Critical Water Supply Areas Nos. 1 and 2**

NJDEP and USGS will identify areas within Critical Water Supply Areas Nos. 1 and 2 that have experienced the greatest recovery using existing USGS ground water models. These areas will be evaluated versus the identified growth areas in The BIG Map initiative to determine if these growth areas can be sustained with either the existing sources of water or from any applicable water that is currently not permitted to be utilized due to the Critical Water Supply Area designation.

### **Action Item 7 – Initiate Study to Determine Sustainable Water Supply for Cape May County (Implement the Gibson Bill)**

Pursuant to P.L. 2001, c.165 (also known as the Gibson Bill (A-658)), NJDEP will execute a contract with The U.S. Geological Survey (USGS) to conduct a study that will determine the sustainable water supply that can be developed within Cape May County that will be able to meet the current and future water supply needs while minimizing adverse groundwater or ecological impacts on the area, including the Pinelands.

Salt-water intrusion has forced the closure of wells in Wildwood, Cape May City, the Villas area and threatens other portions of Lower Township. Another issue of concern for water resources in Cape May is that shallow pumpage and groundwater level declines reduce the groundwater discharge to streams, thereby reducing flow to wetlands and freshwater inputs to the coastal bays. The reduction in stream flow and freshwater may have an adverse impact on both freshwater and estuarine ecosystems. The threat of saltwater intrusion and the realization that shallow groundwater pumpage can contribute to a depletion of surface water has caused concern about the ability of the aquifers of Cape May to produce sufficient water supply to meet future needs.

**Outcome:** The USGS study will determine water demand projections, identify water conservation and reuse options and determine sensitivities of freshwater wetland and brackish/saltwater bay ecosystems to hydrologic changes that could result from groundwater

pumpage and development, and analyze regulatory policy alternatives regarding movement of saltwater interface, streamflow depletion and ecosystem impact. The project will result in the development of scenarios to support sustainable water supply in Cape May County without causing adverse impacts to the Pinelands and other water resources in the region.

The study will evaluate the effect that a new Atlantic City 800' Sand well field would have on the aquifer system from a regional perspective. This study will supplement and expand upon preliminary studies conducted by USGS, which indicated that the longevity of the sustainable water supply in Cape May County may be accomplished by the abandonment of certain production wells and the subsequent construction of an Atlantic City 800' Sand well field, which would be located along the spine of Northern Cape May County. The study will also evaluate various administrative scenarios for management of the water supplies. Various management entity scenarios include, but are not limited to the Cape May County Freeholders, New Jersey American Water Company, and South Jersey Water Supply District Commission. The Department will hold a public hearing on the scope of work for the project by September 2003.

### **Action Item 8 – Issue Report on Atlantic County Water Supply (Executive Order 32)**

During the 2002 drought emergency, Governor McGreevey issued Executive Order 32 (EO 32) due to the water supply concerns in the Atlantic County Townships of Egg Harbor, Galloway and Hamilton. Based upon EO 32, Commissioner Campbell issued Administrative Order 22 which generally prohibited the distribution of water in these three townships pending termination of a state of water emergency in the Townships of Egg Harbor, Galloway and Hamilton and a determination that water supply for these townships were adequate pursuant to EO 32.

The water supply concerns facing this region are not new. The 1982 New Jersey Statewide Water Supply Master Plan identified Atlantic City and 13 nearby coastal communities as an area with potential water supply problems as a result of the substantial growth in this area, as well as that expected in the decades to come. The primary concerns of the 1982 Plan were the potential for: saltwater intrusion that could impair barrier island and near-shore wells in the Atlantic City 800-foot sand aquifer, ground water contamination of the water table aquifer and reductions in streamflow as a result of pumpage from the Kirkwood-Cohansey water table aquifer.

**Outcome:** This report is intended to satisfy the requirements of EO 32. It identifies water supply issues and impacts associated with the withdrawals from Egg Harbor, Galloway and Hamilton Townships as well as the region that shares its water supply. Given the limited time available to conduct this assessment, this report relies heavily on existing information. Based on that information, both immediate and long-term steps are recommended to ensure that the water resources of this region remain sustainable for future generations. To fully assess the water supply available in the study area a far more comprehensive regional study and plan are necessary. This comprehensive plan will take three to four years to complete. Therefore, the interim recommendations in this Report are intended to ensure that a safe and adequate supply of drinking water is protected for the region, while decreasing the likelihood of crossing a threshold of significant environmental impact during the pendency of the comprehensive plan. Several studies are also currently underway, including water budgets and ecological flow goals that will better inform the conclusions of this assessment. As these studies are completed the conclusions of this report should be revisited and adjusted as necessary to reflect newer information.

## ***Statewide Actions Items:***

### **Issue: Reducing or offsetting consumptive uses in New Jersey**

Each day New Jersey discharges approximately 750 million gallons of wastewater directly to the ocean and bays. Reusing less than 1% of this discharge to saltwater could offset the State's entire consumptive water use. Reclaimed Water for Beneficial Reuse (RWBR) involves using highly treated, reclaimed wastewater for non-potable water uses to offset potable ground and surface water withdrawals. Reuse reduces demand on public water supplies and keeps water in the natural hydrologic system, which can be extremely beneficial during drought. Some examples of uses for RWBR are landscape and agricultural irrigation, industrial uses, fire protection, aesthetic fountains and lagoons, construction uses, and sewer flushing. Depending upon the specifics of a source, extensive treatment and disinfection may be required to protect public health and environmental quality, while other applications involving limited public access may require substantially less treatment. RWBR is especially promising in areas where regional sewage treatment plants discharge to the ocean or bays. Most ocean and bay dischargers are secondary treatment plants, so increased treatment levels would be required for most reuse projects. Wastewater mining provides another opportunity for reuse. Water quality, infrastructure and economic issues need to be addressed to increase reuse. Preliminary estimates indicate that the water demand for potable water by golf courses and other major consumptive users in the coastal areas is over 5 billion gallons per month. The use of reclaimed water for these activities in place of potable sources will protect a major portion of the coastal water supply.

### **Action Item 9 – Beneficial Reuse of Reclaimed Water**

NJDEP will promote Reclaimed Water for Beneficial Reuse (RWBR) projects implemented pursuant to the New Jersey Pollutant Discharge Elimination System (NJPDES) program's technical manual.

**Outcome:** The Department will evaluate solutions to overcome the relatively higher cost of RBWR compared to the use of ground or surface waters. These possible solutions will include one or a combination of the following: 1) increased cost of potable water to make RBWR cost-competitive; 2) financial incentives for cost recovery, such as tax incentives comparable to those provided for the power generating industry, or reduced NJPDES permit fees; and 3) revised water allocation regulations to mandate RBWR for large consumptive water users in the coastal areas. This could be addressed by assigning specific economic values to potable water and reclaimed water, which would then be used in feasibility studies. Other regulatory revisions could require the installation of a return line with the installation of sanitary sewer lines thereby reducing the infrastructure costs associated with reuse.

### **Issue: Increasing consumptive use of water for both agricultural and non-agricultural uses**

Shifting demographics and associated water demand has led to water supply problems in many areas of the state, particularly during drought events. NJDEP data indicate that demand centers have shifted and consumptive water use has increased during the 1990s, while statewide total annual water use has remained fairly constant. These patterns have a direct



impact on the state's water resources, increasingly in areas that previously experienced low levels of stress. Water use is greatest during the summer months, which can adversely affect stream flow during dry periods. Potential adverse effects include reduced assimilative capacity of streams, loss of reservoir safe yield, impacts to aquatic biota, increased saltwater intrusion in coastal estuaries and aquifers, and added stress to water purveyor distribution systems. Increasing consumptive use associated with irrigation represents a significant threat because it translates to direct losses to the hydrologic system. Water conservation, practiced most intensely during declared droughts, represents an effective way to use the state's water supplies responsibly while protecting the environment.

### **Action Item 10 – Reduced Consumption from Irrigation through Water Conservation**

Adoption of mandatory water conservation measures, establishment of incentives for conservation and development of an extensive education and outreach initiative. These measures are both structural and behavioral in nature and can be implemented by adopting incentives and disincentives, and through education. The Department will consult with recognized experts in the turf grass field concerning proper watering techniques, including frequency of irrigation and amount of irrigation required to sustain turf grasses during summer dry periods. This information will be assembled and distributed to the public at large as part of an outdoor water conservation education campaign.

### **Issue: Record low stream flows have occurred statewide during recent droughts**

The State's stream gaging and ground water monitoring networks have revealed that the lowest ever recorded stream flows and groundwater levels occurred during the 2002 drought. New surface water withdrawals, increased withdrawals from shallow aquifers, increasing consumptive use, and changing climate can all influence stream flow and groundwater levels. Declining groundwater levels can result in well failure and reduced base flow in streams. Reduced stream flow leads to impairment of aquatic ecosystems, diminished capacity for wastewater assimilation, and reduction in downstream reservoir safe yields. In order to avoid these impacts, NJDEP needs to properly manage the state's water resource by first developing an accurate water budget that determines the true amount of available water and existing withdrawals, location and type of uses, and the amount and location of water returned to each basin across the state.

### **Action Item 11 – Completion of Water Budgets Statewide**

NJDEP will develop water budgets to quantify the volume of water available for consumption in each Water Supply Planning Area (HUC – 11). This requires three steps: (1) An analysis of water transfers (fresh water, sewage, reclaimed wastewater) into, out of, and within watersheds; (2) an analysis of natural hydrologic factors (precipitation, evapotranspiration, ground water recharge, stream flow); and (3) an analysis of leakage of ground water to confined aquifer systems in Coastal Plain aquifers.

**Outcome:** Once completed, the water budgets will allow an analysis of impacts to stream flow under various water-use scenarios. Combined with the adoption of allowable thresholds for

resource depletion, the water budgets will allow identification of areas where water-supply allocations have exceeded targeted thresholds, and quantification of available water supply based on limiting thresholds. Water budgets for confined aquifers that do not function within the boundaries of small watersheds are required as well. A thorough analysis of water budgets for some watershed-based planning areas will require an understanding of water losses to deeper, confined aquifer systems within the New Jersey Coastal Plain. These losses are significant in some areas of the state. A number of regional water resource investigations and associated computer simulations of confined aquifer systems performed over the past two decades are available to be used as the basis for quantifying losses from water-table aquifers within surface watersheds to deep, confined aquifer systems. The water budgets for confined aquifers will examine the inputs and outputs of these systems to determine their future water supply potential and related water resource issues, including the potential for saltwater intrusion, the impact to existing Water Supply Critical Areas, and the potential to bring about new Water Supply Critical Areas.

### ***Water Supply Legislative Initiatives:***

#### **Issue: NJDEP Supports the Following Legislation**

##### **S169 (New Jersey Clean Water Trust Fund)**

This legislation would establish a New Jersey Clean Water Trust Fund, to be administered by the Department of Environmental Protection. The legislation will establish a stable funding source supported by two new user fees based on water consumption and water diversion to provide grant and loan funding to municipalities, counties and authorities for water resources and water quality projects. Projects which protect existing water supplies through the acquisition of watershed and wetlands areas; maintain existing public open space; restore lakes and reservoirs; establish new water impoundments, interconnect existing water supplies, and extend water supplies to areas with contaminated ground water; control flooding, including the restoration and repairs of dams; prevent salt water intrusion; enforce rules and regulations adopted pursuant to the New Jersey "Water Pollution Control Act"; and provide the State match for federal projects funded pursuant to the "Water Resources Development Act" would be eligible for funding pursuant to this bill. Some of these activities have been undertaken over the years; however, additional funds are necessary. This bill would provide a stable and continuous source of funding for natural resource projects designed to protect the State's water resources and thereby the quality of the State's water supplies.

#### **Issue: NJDEP Seeks Changes to the Following Legislation**

##### **Small Water Company Takeover Act (1981 N.J.S.A. 58:11-59 et seq.)**

The Act currently mandates that any company, purveyor or entity, other than a governmental agency that provides water for human consumption and which regularly serves less than 1,000 customers (connections) and is unable to comply with a Departmental order concerning water quality or supply will be subject to a public hearing held to determine what actions and expenditures are required for correction, including acquisition of the failing company. The Department would like for the Act to include governmental agencies.



## ***Department Initiatives:***

### **Issue: NJDEP Undertakes Regulatory and Fee Changes**

#### **Water Supply Allocation Rules (N.J.A.C. 7:19-1.1 et seq.)**

The Water Supply Allocation rules are being updated to coincide with changing trends and to further assure the sustainability of the State's water supplies. The current rules were last revised in 1995, while the allocation fees were last revised in 1993. The revised fee schedule will propose to increase fees to eliminate the current deficit in administering the water allocation program, spread program costs more equitably among various user groups, encourage beneficial reuse of reclaimed water, reflect more in-depth analyses of a diversion's impacts on water resources and wetlands, and support the Governor's Anti-Sprawl Initiative.

### **Issue: NJDEP to Coordinate with BPU**

#### **Peak Use Pricing**

The intent of this issue is to promote the Governor's vision of smart growth as it relates to water conservation and the sustainability of the State's water supply sources. NJDEP will coordinate with BPU to investigate the possibility of a different pricing structure that would increase the cost of water to act as an incentive for water conservation, especially during the critical times of the year when streamflows and/or ground water levels are low.

### **Issue: Contaminated Water Resources**

#### **NJDEP Pursues Natural Resource Damages for Contaminated Water Resources**

Water is an increasingly scarce commodity in certain areas of the State and its true value has become more evident not only to the environment, but also to sustaining human conditions. NJDEP will proactively be pursuing polluters of ground water to compensate the citizens of the State for the loss of this public resource.